

What is claimed as new and desired to be protected by Letters

Patent of the United States is:

1. An information compression apparatus which

5 compresses information and uses a DCT frequency conversion
algorithm, comprising:

a plurality of block registers which store block-based
multi-bit quantized data converted from the information
output from an quantization execution module;

10 a correction level register which presets a correction
level indicating a degree of data correction;

a first control mechanism which controls so as to
perform a scanning operation for scanning each block of the
plurality of block registers and a search operation for
15 searching a block having a valid coefficient; and

a data correction mechanism which corrects data to
modify the valid coefficient of the block searched by the
first control mechanism to an invalid coefficient based on
the correction level started in the correction level register.

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2. The information compression apparatus as defined
in claim 1, wherein the valid coefficient is a coefficient
having any coding amount except zero.

25 3. The information compression apparatus as defined
in claim 1, wherein the scanning operation includes an

inverse zigzag operation.

4. The information compression apparatus as defined in claim 1, further comprising a second control device which 5 receives multi-bit quantized data output from the quantized execution module before the multi-bit quantized data is transmitted to the plurality of block registers and causes the first control mechanism to start the search operation.

10 5. The information compression apparatus as defined in claim 1, wherein the data correction device moves addresses of an isolated valid coefficient searched instead of modifying the valid coefficient to the invalid coefficient when modifying the valid coefficient to the invalid 15 coefficient based on the correction level causes the information deterioration to an extent exceeding a predetermined limit so that the isolated valid coefficients are consecutively arranged.

20 6. The information compression apparatus as defined in claim 1, further comprising a block register net which comprises a plurality of logical OR circuits corresponding to a plurality of frequencies used by the DCT frequency conversion algorithm such that each of the plurality of 25 logical OR circuits outputs 1 when any one of the block registers connected thereto has a valid coefficient, and

wherein the first control mechanism cancels its scanning operation.

7. The information compression apparatus as defined
5 in claim 6, wherein a number of the plurality of logical OR
circuits is equal to a number of the plurality of frequencies.

8. The information compression apparatus as defined
in claim 6, wherein when a quantization table for quantizing
10 the plurality of block coefficients stored in registers is
relatively large, the plurality of logical OR circuits for a
high frequency side are connected to each other.

9. The information compression apparatus as defined
15 in claim 1, wherein the apparatus uses a Huffman coding
method.

10. The information compression apparatus as defined
in claim 1, wherein the apparatus uses a JPEG coding method.
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11. The information compression apparatus as defined
in claim 1, wherein the apparatus uses a sound data coding
method.

25 12. An information compression apparatus which
compresses information and uses a DCT frequency conversion

algorithm, comprising:

 a plurality of block register means for storing block-based multi-bit quantized data converted from the information output from an quantization execution module means;

5 a correction level register means for presetting a correction level indicating a degree of data correction;

 a first control means for controlling so as to perform a scanning operation for scanning each block of the plurality of block register means and a search operation for searching

10 a block having a valid coefficient; and

 a data correction means for correcting data to modify the valid coefficient of the block searched by the first control means to an invalid coefficient based on the correction level started in the correction level register

15 means.

13. The information compression apparatus as defined in claim 12, wherein the valid coefficient is a coefficient having any coding amount except 0.

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14. The information compression apparatus as defined in claim 12, wherein the scanning operation includes an inverse zigzag operation.

25 15. The information compression apparatus as defined in claim 12, further comprising a second control means for

receiving multi-bit quantized data output from the quantized execution module means before the multi-bit quantized data is transmitted to the plurality of block register means and causing the first control means to start the search operation.

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16. The information compression apparatus as defined in claim 12, wherein the data correction means moves addresses of an isolated valid coefficient searched instead of modifying the valid coefficient to the invalid coefficient 10 when modifying the valid coefficient to the invalid coefficient based on the correction level causes the information deterioration to an extent exceeding a predetermined limit so that the isolated valid coefficients are consecutively arranged.

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17. The information compression apparatus as defined in claim 12, further comprising a block register net means for comprising a plurality of logical OR circuit means corresponding to a plurality of frequencies used by the DCT 20 frequency conversion algorithm such that each of the plurality of logical OR circuit means outputs 1 when any one of the block register means connected thereto has a valid coefficient, and wherein the first control means cancels its scanning operation.

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18. The information compression apparatus as defined

in claim 17, wherein a number of the plurality of logical OR circuit means is equal to a number of the plurality of frequencies.

5 19. The information compression apparatus as defined in claim 17, wherein when a quantization table for quantizing the plurality of block coefficients stored in register means is relatively large, the plurality of logical OR circuit means for a high frequency side are connected to each other.

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20. The information compression apparatus as defined in claim 12, wherein the apparatus uses a Huffman coding method.

15 21. The information compression apparatus as defined in claim 12, wherein the apparatus uses a JPEG coding method.

20 22. The information compression apparatus as defined in claim 12, wherein the apparatus uses a sound data coding method.

23. An information compression method for compressing information and using a DCT frequency conversion algorithm, comprising the steps of:

25 presetting a predetermined correction level indicating a degree of data correction;

latching quantized data including valid coefficients and invalid coefficients into a block register;

performing an inverse zigzag scan for scanning the block register to search a valid coefficient;

5 modifying an initially searched valid coefficient to an invalid coefficient;

counting a number of searched valid coefficients;

modifying a subsequent searched valid coefficient to the invalid coefficient;

10 incrementing the number of valid coefficients by one;

continuously performing the inverse zigzag scan when the number of searched coefficients counted in the counting step is smaller than the collection level in the presetting step; and

15 transferring the data of the block register to a coding module when the correction counter value reaches the correction level.

24. The information compression method as defined in

20 claim 23, wherein when a valid coefficient is modified to an invalid coefficient in the modifying steps, valid coefficients smaller than a predetermined threshold value are deleted.

25. The information compression method as defined in

claim 23, further comprising a presearching step for

searching quantized data output from the quantization execution module before the search step.

26. The information compression method as defined in
5 claim 23, further comprising an address moving step for
moving addresses of isolated valid coefficients searched such
that the isolated valid coefficients are consecutively
arranged when the information deterioration to an extent
exceeds a predetermined limit in the modifying steps, and
10 wherein the modifying steps are canceled instead.

27. The information compression method as defined in
claim 23, further comprising a calculating step for
calculating a total sum of coefficients of block registers
15 arranged along each scanning line corresponding to one of
different frequencies used in the DCT frequency conversion
algorithm, and a start address changing step for changing an
address of the block register to start the inverse zigzag
scan.

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28. The information compression method as defined in
claim 27, further comprising a summing up step for summing up
a plurality of the total sums calculating by calculating step
to execute code calculation at an appropriate part of the
25 block register.

29. A program of an information compression causing a computer to execute an information compression operation using a DCT frequency conversion algorithm according to a method comprising the steps of:

5 presetting a predetermined correction level indicating a degree of data correction;

latching quantized data including valid coefficients and invalid coefficients into a block register;

10 performing an inverse zigzag scan for scanning the block register to search a valid coefficient;

modifying an initially searched valid coefficient to an invalid coefficient;

counting a number of searched valid coefficients;

15 modifying a subsequent searched valid coefficient to the invalid coefficient;

incrementing the number of valid coefficients by one;

continuously performing the inverse zigzag scan when the number of searched coefficients counted in the counting step is smaller than the collection level in the presetting 20 step; and

transferring the data of the block register to a coding module when the correction counter value reaches the correction level.

25 30. The program of an information compression as defined in claim 29, wherein when a valid coefficient is

modified to an invalid coefficient in the modifying steps, valid coefficients smaller than a predetermined threshold value are deleted.

5 31. The program of an information compression as defined in claim 29, further comprising a presearching step for searching quantized data output from the quantization execution module before the search step.

10 32. The program of an information compression as defined in claim 29, further comprising an address moving step for moving addresses of isolated valid coefficients searched such that the isolated valid coefficients are consecutively arranged when the information deterioration to 15 an extent exceeds a predetermined limit in the modifying steps, and wherein the modifying steps are canceled instead.

20 33. The program of an information compression as defined in claim 29, further comprising a calculating step for calculating a total sum of coefficients of block registers arranged along each scanning line corresponding to one of different frequencies used in the DCT frequency conversion algorithm, and a start address changing step for 25 changing an address of the block register to start the inverse zigzag scan.

34. The information compression method as defined in
claim 33, further comprising a summing up step for summing up
a plurality of the total sums calculating by calculating step
5 to execute code calculation at an appropriate part of the
block register.

35. A program of an information compression causing a
computer using a JPEG coding method to execute an information
10 compression operation according to a method comprising the
steps of:

 presetting a predetermined correction level indicating
 a degree of data correction;

 latching quantized data including valid coefficients
15 and invalid coefficients into a block register;

 performing an inverse zigzag scan for scanning the
 block register to search a valid coefficient;

 modifying an initially searched valid coefficient to an
 invalid coefficient;

20 counting a number of searched valid coefficients;

 modifying a subsequent searched valid coefficient to
 the invalid coefficient;

 incrementing the number of valid coefficients by one;

 continuously performing the inverse zigzag scan when
25 the number of searched coefficients counted in the counting
 step is smaller than the collection level in the presetting

step; and

transferring the data of the block register to a coding module when the correction counter value reaches the correction level.

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36. A program of an information compression causing a computer using a sound data coding method to execute an information compression operation according to a method comprising the steps of:

10 presetting a predetermined correction level indicating a degree of data correction;

latching quantized data including valid coefficients and invalid coefficients into a block register;

15 performing an inverse zigzag scan for scanning the block register to search a valid coefficient;

modifying an initially searched valid coefficient to an invalid coefficient;

counting a number of searched valid coefficients;

20 modifying a subsequent searched valid coefficient to the invalid coefficient;

incrementing the number of valid coefficients by one;

25 continuously performing the inverse zigzag scan when the number of searched coefficients counted in the counting step is smaller than the collection level in the presetting step; and

transferring the data of the block register to a coding

module when the correction counter value reaches the correction level.

37. A computer-readable media storing a program of an
5 information compression causing a computer to execute an information compression operation using a DCT frequency conversion algorithm according to a method comprising the steps of:

 presetting a predetermined correction level indicating
10 a degree of data correction;
 latching quantized data including valid coefficients and invalid coefficients into a block register;
 performing an inverse zigzag scan for scanning the block register to search a valid coefficient;
15 modifying an initially searched valid coefficient to an invalid coefficient;
 counting a number of searched valid coefficients;
 modifying a subsequent searched valid coefficient to the invalid coefficient;
20 incrementing the number of valid coefficients by one;
 continuously performing the inverse zigzag scan when the number of searched coefficients counted in the counting step is smaller than the collection level in the presetting step; and
25 transferring the data of the block register to a coding module when the correction counter value reaches the

correction level.